JOURNAL
OF THE
WASHINGTON ACADEMY OF SCIENCES

VOL. 9 MARCH 19, 1919 No. 6

CRYSTALLOGRAPHY.—*The classification of mimetic crystals.* EDGAR T. WHERRY and ELLIOT Q. ADAMS, Bureau of Chemistry.[1]

As more or less fully described in all text-books on crystallography, crystals which belong fundamentally to one system or symmetry class may at times exhibit features characteristic of other systems or classes. This may result from accidents of growth, or from the approach of the angles to those of other systems, either with or without twinning. It is customary to group together part or all of these phenomena under the general head of mimicry, mimetism, or mimetic behavior, and to add the prefix *pseudo-* to the name of the system or class to which the crystals apparently belong. In discussing certain crystallographic relationships, however, it may become desirable to distinguish the several types of mimetic phenomena on the basis of their underlying causes, and to have special terms, for both the original system or class and the one imitated, to apply in each case.

The principal types of mimetic behavior are presented in table 1, together with prefixes proposed for, and typical illustrations of, each of them. The prefixes are derived from well-known Greek roots, transliterated in accordance with accepted usage. The illustrations are drawn from minerals, since the features in question are most familiar in them, although the greatest use for the classification may prove to be among artificial

[1] Contribution from the Crystallography and Color Laboratories.

compounds. The subdivisions are, it should be noted, not mutually exclusive, and one crystal may fall simultaneously into two or more of them, although usually most typical of one.

The names of the crystal systems and classes used are drawn largely from Dana, with the following exceptions: cubic in place

TABLE 1.

TYPES OF MIMETIC PHENOMENA, WITH PREFIXES PROPOSED, AND ILLUSTRATIONS

General prefixes for the whole group { for original class, *homo-* (same); for class imitated, *pseudo-* (false)

Cause	Extrinsic; peculiarities of habit	Intrinsic; angles approaching those of other classes	
		Crystals twinned	Crystals simple
Resulting change an apparent increase in symmetry.....			
Prefix for original class	*crypto-* (hidden)	*ana-* (upwards)	*lepto-* (slight)
Prefix for class imitated.....	*pheno-* (apparent)	*syn-* (together)	*peri-* (around)
Illustration.....	quartz, cryptotrigonal but pheno-hexagonal	aragonite, anarhombic but synhexagonal	albite, leptotriclinic, but perimonoclinic
Resulting change an apparent decrease in symmetry.....			
Prefix for original class	*endo-* (within)	*kata-* (downwards)	....
Prefix for class imitated.....	*ecto-* (without)	*para* (beside)	....
Illustration.....	copper, endo-cubic but ecto-trigonal	spinel, kata-cubic but para-trigonal	....

of isometric; trigonal as a distinct system; and rhombic in place of orthorhombic. No changes in the plans of nomenclature here proposed will need to be made should the use of other names be preferred.

DISCUSSION OF TABLE 1

Whenever it is desired to refer to mimetic behavior without considering the cause or effect as such, the prefixes *homo-* and *pseudo-*, signifying, respectively, "the same" and "false," may be used. For instance, the crystallization of the aragonite group may be described as "homo-rhombic but pseudo-hexagonal."

The cause of mimetic phenomena may be, first, extrinsic, or connected with influences outside of the crystal, leading to peculiarities of habit which may constitute either apparent increase or apparent decrease in symmetry. It not infrequently happens that the only forms present on a crystal possessing a low degree of symmetry may be those which the class represented has in common with other more symmetrical classes. A good example of this is quartz, which though actually trigonal and trapezohedral, may show only the first order prism and the corresponding plus and minus rhombohedrons. If perfectly developed, the only symmetry which this combination can show is holohedral-hexagonal. It is here suggested that the true class of a substance showing such a relationship be indicated by the prefix *crypto-*, meaning "hidden," and the class which is apparently represented by *pheno-*, signifying "apparent." The quartz crystals showing only hexagonal forms would then be fully described by stating them to be: "crypto-trigonal-trapezohedral but pheno-hexagonal-holohedral." Other illustrations are pyrite, which is often crypto-pyritohedral but pheno-holohedral cubic; apatite, which is usually crypto-pyramidal but pheno-holohedral hexagonal; and so on.

A still more frequent type of mimetic effect, though not always classed as such, is the decrease in apparent symmetry due to distortion or irregularity in habit produced by external influences. This effect is, indeed, almost universally present among crystals, really perfect development being practically never met with. Whenever simple descriptive terms are needed for this type of relationship, the prefixes *endo-*, meaning "inside," and *ecto-*, "outside," may be used. To cite a familiar example, the metal copper, though well known to be fundamentally cubic, or endo-cubic, is almost always distorted, and may be ecto-trigonal, ecto-rhombic, or even ecto-triclinic.

The second class of causes of mimetic phenomena may be termed intrinsic, since essential features of the internal structure of the crystal are responsible. The effect is connected with the approach of the angles in crystals of one system or class to those of another, and develops most commonly through more or less

multiple twinning. The symmetry is usually increased by such twinning, hence good descriptive prefixes are *ana-*, meaning "upwards" and *syn-*, "together." The common twinned crystals of aragonite, for instance, would then be termed: "ana-rhombic but syn-hexagonal;" phillipsite, "ana-monoclinic but syn-tetragonal;" boracite, "ana-rhombic but syn-cubic," and so on. Less frequently the symmetry is decreased by twinning, whereupon the original class may be designated by *kata-*, meaning "downwards" while *para-* "beside" referring to the individual parts of the twins, may be used for the imitated one. Thus spinel and other cubic minerals, when twinned on the octahedron, often become apparently trigonal; they may be described as "kata-cubic but para-trigonal."

There is still another situation in which the crystals of one system may imitate those of another, consisting in the mere approach in angular values without twinning or distortion. It should be noted here that the prefix *hypo-* has been applied rather extensively to this type of relationship, though it is not limited to mimetic crystals, but is used broadly for approach of angular values to within 15° of those of the cubic, tetragonal, or hexagonal systems. A new term is therefore needed for the purpose of the present classification. The prefixes suggested to describe this type of relationship are *lepto-*, which means slight, and *peri-*, which means around or about. For instance, the triclinic plagioclase feldspars, such as albite, approach the monoclinic orthoclase very closely in angles and habit. The deviation of their interaxial angles α and γ from 90°, the value characteristic of the monoclinic system, is but slight, and this can be well expressed by calling them "lepto-triclinic but peri-monoclinic," that is, "weakly triclinic, and approaching monoclinic angular relationships." Other well-known examples are chalcocite, which is lepto-rhombic and peri-hexagonal; muscovite, lepto-monoclinic and peri-hexagonal; and chondrodite, lepto-monoclinic and peri-rhombic.

In conclusion it may be noted that the purpose of this paper is not primarily the development of terms for these types of mimetic phenomena, but rather the pointing out that it may at

times be useful to distinguish the different types. Even though none of the prefixes proposed be thought worthy of general adoption by crystallographers, it is hoped that the desirability of some method of distinction of the several types will not be forgotten, and that in future descriptions of mimetic crystals it will rarely be considered sufficient to refer to them only by the prefix "*pseudo.*"

BOTANY.—*Synopsis of the genus Ochroma, with descriptions of new species.* W. W. ROWLEE, Cornell University. (Communicated by Frederick V. Coville.)

The utilization of the wood of *Ochroma* has brought that genus into prominence during the last few years. The manufacture of buoyancy and insulation products, such as life rafts, refrigerators, and parts of lifeboats and aeroplanes, especially in connection with the war, has become very extensive. Eighty thousand floats made of balsa wood were used in constructing the 250-mile submarine mine barrage in the North Sea; war vessels as well as transports were in so far as possible equipped with balsa life rafts and lifeboats; and special refrigerating trucks with balsa as the insulating material were used in France. The characteristics of the wood were investigated by the late Professor R. C. Carpenter in a very thorough manner and the results were published in a paper entitled *The properties of balsa wood.*[1] The importance of obtaining first-hand information regarding the quantity of wood available, and of discriminating between the usable and unusable wood, led the American Balsa Corporation to commission the writer and his son in April, 1918, to explore Central America with a view to finding out the amount of timber available and to investigate as to the quality of the wood and the kinds that grow in different regions. For this purpose we spent seven months in Panama, Costa Rica, Nicaragua, and Guatemala. The taxonomic results of the survey are given briefly in this paper.

The wood of the trees of the genus *Ochroma* is the most notable among lightweight woods. It is generally known in Spanish

[1] Trans. Amer. Soc. Civ. Eng. 81: 125. 1917.

America as "balsa," and that word has been transferred to and is in general use in the United States. Balsa is the Spanish word for raft, and it was applied to this tree because the Spanish colonists, when they migrated to the New World, found it in use by the natives for rafts. When they found a tree obviously related to an Old World species, the colonists usually transferred the European name to the new tree. Thus, "roble," the Spanish name for oak, was applied to like trees in the New World; but there was nothing in Spain in any way like balsa, and so the name of the object for which this wood was used was transferred to the tree itself. This name was and still is largely confined to countries where the trees were so used, that is, Ecuador, Colombia, and Costa Rica. In Nicaragua the tree is called "gatillo;" in Guatemala, "cajeto" on the west coast, and "moho" and "lana" on the east coast; in Cuba, "lanillo;" in Jamaica "corkwood" and "down tree," or as the Jamaican negroes have it, simply "dum." In these regions it is doubtful if it was ever used for rafts.

Balsa is a very common and conspicuous tree in tropical America. It is distinguished not only by its light soft wood, but also by its large simple leaves, large solitary flowers, and very conspicuous fruit, which is not unlike a cotton boll on a large scale. When the fruit is matured, but has not finally burst, it looks much like a rabbit's foot and presumably from this the first species of *Ochroma* to be described received the specific name "*lagopus*." When the fruit finally bursts and the mass of down falls to the earth, it suggests the fur of a rabbit. The seeds are enveloped in this fur and are disseminated by it. They resemble small grape seeds and, unlike cotton, the "down" is not firmly and permanently attached to the seed.

The tree of the Greater Antilles was first given a binary name, *Ochroma lagopus*, by the Swedish botanist, Olaf Swartz, in 1788[1] and was more fully described by him four years later.[2]

At about the same time Humboldt collected specimens of another species in the upper valley of the Magdalena River in

[1] Prodr. Veg. Ind. Occ. 98. 1788.

[2] Act. Stockh. 148. *pl. 6.* 1792. See also Swartz's later description, Fl. Ind. Occ. 2: 1143. 1800.

Colombia and this was described by Willdenow under the name *Ochroma tomentosa*. This second species has never been found outside the region where Humboldt collected it. Swartz's type locality is "Jamaica, Hispaniola," but specimens from South America, Central America, and the West Indies have been universally referred to *O. lagopus*. These two species are the only ones recognized in botanical literature at the present time.

Ochroma is confined to tropical America. Its nearest relative in the eastern hemisphere is the baobab tree. It is a relative of the "ceiba" (*Bombax*) and "quipo" (*Cavanillesia*), of tropical America.

The species of this genus most frequently occur in the lowlands and foothills, though rarely, if ever, where the soil is at all affected by brackish or salt water. They have not been discovered in the higher altitudes, that is, at more than 1,000 meters above sea level.

Balsa is usually a second-growth tree, though it does occur as an isolated tree in the primeval forest. It appears promptly and abundantly where clearings have been made by natural agencies, such as floods and fires, or by human cultivations. In this respect it might properly be called a tree "weed." The natural seeding in some places produces such an abundance of young plants as to suggest weeds in a neglected garden. The tree's growth is very rapid. During the first five or six years of its life it may attain a trunk diameter of 60 to 75 cm., an average increase in thickness of 12 or 13 cm. per year. It also grows very rapidly in height, often attaining under favorable conditions 16 or 20 meters in five or six years. This gives it a place among the most rapidly growing trees known, if indeed it is not the most rapid of all.

In the natural state, the wood is very perishable. One rarely sees the remains of trees of balsa in the tropical forests. They decay with apparently the same rapidity as a cotton fabric; the wood absorbs moisture readily and shrinks and warps badly. This is due undoubtedly to the feeble lignification of the cell walls and to the lack of aseptic properties such as the timber of oak and pine possess. It was only when the engineers of the

American Balsa Company, after protracted investigation and experiments, overcame these defects that the wood could be fabricated into valuable products.

The leaves of *Ochroma*, even on an individual tree, are variable. The seedlings of the different species are much more difficult to distinguish, one from the other, than are the mature trees. Even in the case of two species so distinct as *O. concolor* and *O. limonensis* the seedlings are very much alike. We have based our descriptions upon the leaves of mature trees. The flowers, however, are characteristic for each of the several species, though they vary in shape, size, and texture.

TABLE 1.

APPROXIMATE TIME OF FLOWERING AND FRUITING OF OCHROMA

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
concolor			Fl.	Fl.	Fr.	Fr.						
lagopus				Fl.	Fl.	Fr.	Fr.					
limonensis							Fl.	Fl.	Fr.	Fr.		
grandiflora									Fl.	Fl.	Fr.	Fr.
tomentosa			Fl.?					Fl.	Fl.	Fr.	Fr.	
velutina		Fl.	Fl.	Fr.	Fr.							
bicolor	Fl.	Fl.	Fr.	Fr.								
boliviana								Fl.	Fl.	Fr.	Fr.	
obtusa			Fl.	Fl.	Fr.	Fr.						

The species of *Ochroma* differentiate into two classes as regards time of flowering and fruiting. In one group the fructification takes place in the months of November and April; in the other flowers and fruits develop from May to October.

Table 1 is based on our observations in Central America, supplemented by an examination of herbarium specimens and notes by collectors. Five of the species bear flowers and fruit in one season of the year and four in the other season. So far as we could learn, the season of flowering is clearly marked. For example, no flowers or fruit were to be found on the Limón balsa (*O. limonensis*) from December to March, while both were present in profusion from May to August. On the other hand no flowers or fruit were to be found on the Guapiles balsa (*O. bicolor*) from May to August, but an abundance occurs from

November to February. These species grow in contiguous regions and, though they may overlap somewhat in distribution, they are nevertheless distinguished by well marked morphological characters.

With the exception of *O. limonensis* all these species flower and fruit in the dry season of their respective regions. In northeastern Costa Rica there is no well defined dry season and this probably accounts for the exceptional flowering period of *O. limonensis*.

KEY TO SPECIES

Calyx lobes carinate. Outer sepals triangular acuminate.
  Leaves thin, green on both sides, conspicuously 5 to 7-lobed, glabrous or nearly so ..... 1. *O. concolor.*
  Leaves thick, rusty-pubescent, at least beneath, obsoletely 3 to 5-lobed.
    Flowers 10 cm. long ..... 2. *O. lagopus.*
    Flowers 15 cm. long or more.
      Calyx tube cylindric ..... 3. *O. limonensis.*
      Calyx tube widened upward ..... 4. *O. grandiflora.*
Calyx lobes not carinate.
  Leaves repand-dentate ..... 5. *O. tomentosa.*
  Leaves not repand-dentate.
    Calyx lobes triangular, acute, coriaceous.
      Leaves rusty-tomentose on both sides, the hairs 5 to 7-(mostly 6)branched ..... 6. *O. velutina.*
      Leaves glabrous and dark green above, white and stellate-pubescent beneath, the hairs 10 to 15-(mostly 12)branched. 7. *O. bicolor.*
    Calyx lobes elliptic or orbicular, obtuse, herbaceous.
      Calyx lobes elliptic; leaves densely velutinous beneath. 8. *O. boliviana.*
      Calyx lobes orbicular; leaves scantily pubescent beneath. 9. *O. obtusa.*

1. **Ochroma concolor**, n. sp. BARRIOS BALSA.

A tree attaining 25 meters in height and 1 meter in diameter, in woodlands developing a long, smooth trunk, in the open a short trunk and a round, symmetrical top; heartwood in older trees red, wet, and heavy, the wood of young trees white and light; leaves thin and membranous, large and conspicuously lobed, with 5 to 7 acute lobes separated by broad, convex sinuses, green and glabrous on both sides except for a few tufts of brownish tomentum on the primary veins beneath; stipules large, ovate, with prominent midribs; flowers 10 cm. long, glabrous; calyx tube 6 cm. long, glabrous within; calyx lobes very dissimilar, 2 cm. long, the outer 2 acuminate, with a prominent

keel on the back, the inner 3 oblong, keeled, with expanded margin; pod 12 cm. long; seed with a short, stout funicle.

Type in the U. S. National Herbarium, no. 862345, collected at Trece Aguas, Alta Verapaz, Guatemala, May 9, 1914, by O. F. Cook and C. B. Doyle (no. 82). The following Guatemalan specimens in the National Herbarium also represent this species: *Mrs. William Owen* 11, 11A; *Goll* 230. The flowers are borne in December and January and the fruit in February and March.

This species is very different from any other of the genus. It is known only from the country surrounding the head of the Bay of Honduras. It has not been reported from outside of Guatemala, but undoubtedly grows in adjacent Honduras and British Honduras, and in all probability in southern Yucatán. It occurs throughout the lower Motagua Valley from above Quirigua to the sea. Well developed trees are found on the reservation containing the Maya ruins, near Quirigua. It also occurs rather abundantly in the valley of Lake Izabal and the Golfete.

Goll reports the name "kapok;" Mrs. Owen gives the Indian names "jujul" and "puj." The local names given us were "lana" and "cajeto."

There are two distinct species of *Ochroma* in northeastern Guatemala. In addition to the one characterized above, there is another which is probably specifically identical with the species of northern Costa Rica. *Ochroma concolor* grows on lower ground than the Costa Rican species or, indeed, than any other species of *Ochroma* known to us. In the Great Swamp, along the San Francisco del Mar River, east of Barrios and west of the mouth of the Motagua, many large trees occur on ground that is inundated a considerable portion of the year. The species occurs also on higher ground, as on the hospital grounds at Quirigua, as well as near Virginia and along the Tomeja River.

2. **Ochroma lagopus** Swartz, Prodr. Veg. Ind. Occ. 98. 1788.

WEST INDIAN BALSA.

Up to the present time, all the species of the genus except *Ochroma tomentosa* Willd. have been included under this name, which, there is every reason to believe, should be restricted to include only forms that grow in the West Indies.

Smaller in size than the preceding species, usually not exceeding 30 cm. in diameter and 18 meters in height; leaf blades small (15 to 20 cm.), brown-tomentose to nearly glabrous; flowers small, 10 cm. long; calyx tube 6 cm. long, the lobes 2.5 cm. long, 2 cm. wide at the base and 4.5 cm. at the summit, prominently carinate on the back.—Flowers borne in February and March; fruit in April and May.

Known in Cuba as "lanero;" in Jamaica as "corkwood," "down-tree," "dum," and "bombast mahoe."

CUBA: Eastern Cuba, 1856–57, *C. Wright* 38; San Luis, Oriente, April 2, 1909, *Britton* 2334; Sevilla Estate near Santiago, August 31, 1906, *N. Taylor* 140 (a tree 30 meters high, the trunk 28 cm. in diameter).

HISPANIOLA: Taradia, prope Barahona, 1910, *Tuerckheim* 2826; without locality, *Wright, Parry & Brummel* 20, 21.

PORTO RICO: Manati, April 4, 1887, *Sintenis* 6766; Utuado, March, 1906, *M. A. Howe;* San Juan, December, 1898, *Dignowitz* 780.

JAMAICA: Castleton, March 21, 1915, *Harris* 11962.

3. **Ochroma limonensis,** n. sp. LIMÓN BALSA.

A tree of very rapid growth, attaining large dimensions, up to a meter in diameter and 30 meters in height; bark gray, somewhat mottled; wood white, the annual rings indistinguishable; leaves large, nearly orbicular, 25 cm. across, obsoletely 3- to 5-lobed (the margin entire), nearly or quite glabrous above, refescent-tomentose beneath; hairs 7 to 10-(mostly 8)branched; flowers 18 cm. long, yellowish white; calyx tube 9 cm. long, cylindric, glabrous but warty on the outside, hairy within; calyx lobes acuminate, carinate on the back, 4 cm. long, 2 cm. wide at the base, the inner with feltlike margins; pods, 15 cm. long; funicle about half as long as the seed.—Flowers borne in May and June; fruit in July and August.

This is the balsa of the lowlands of the Caribbean coast of Costa Rica and Panama, extending as far west as the Reventazón River, Costa Rica, and east into Panama. Fine groves have developed along the Banana, Bananito, Estrella, and Sixaola Rivers. Our nos. 1, 2, and 3 are of this species, no. 1, collected on San Clemente Farm east of the Bananito River, Costa Rica, being the type. No. 2 is from a tree at Zent; no. 3 was collected near Moin Junction. The Zent tree is of special interest. It was started as a seedling in April, 1915, and was photographed September 15th of that year. When measured by us in May, 1918, it was 16 inches in diameter, and had therefore grown at the rate of five inches per year. Local observers agree that this individual is not in any way exceptional.

4. **Ochroma grandiflora,** n. sp. ECUADOR BALSA.

A tall tree with mottled gray bark and very light wood; leaves on mature trees nearly entire, orbicular, 20 cm. wide, on young trees lobed, very large (up to 90 cm.), rufescent beneath, glabrous above; flowers 15 to 18 cm. long, showy; calyx tube 7 cm. long, spreading above, 3 cm. wide at the base, 7 cm. wide at the top, granular-puberulent outside, hairy within; calyx lobes 4 cm. long, 3 cm. wide at the base, carinate, the inner ones broadly margined; petals large and showy, exceeding the stamens and style, the limb 5 cm. broad, gradually

narrowing into a broad claw 2 cm. wide, prominently parallel-veined.—Flowering in July and August; fruiting in September and October.

Type in the U. S. National Herbarium, collected below Huigra, Ecuador, in 1918, by J. N. Rose (no. 22,604). Also collected at Hacienda La Josefina, San Carlos, Ecuador, September, 1918, by Capt. Claussen.

5. **Ochroma tomentosa** Willd. Enum. Hort. Berol. 695. 1809

HUMBOLDT'S BALSA.

The original description of this species is as follows: "O. foliis cordatis subtrilobis repandis, subtus tomentosis." It was based on specimens collected by Humboldt and Bonpland in "America Meridionali," and was reported from Colombia by Triana and Planchon in 1862.[1] It has been collected recently by Rusby and Pennell (no. 271), July 24, 1917, at Quebrada de Angeles, above Natagaina, Department of Huila, Colombia, and also by Pennell (no. 3557), at Honda, Department of Tolima, Colombia. The collectors noted it as a large tree with white petals.

The calyx tube is very coarsely and densely tomentose with brown hairs; the tube is short and broad. Most characteristic of the species, however, are the repand dentations, 1 cm. apart, evenly distributed around the margin of the leaf, giving it the appearance of the leaf of *Populus grandidentata*.

Ochroma tomentosa has not been reported beyond the limits of the upper Magdalena River in Colombia, a region through which Humboldt's expedition passed.

6. **Ochroma velutina,** n. sp. RED PACIFIC COAST BALSA.

Wide-spreading tree, usually bifurcately branched, with smooth, light gray bark; heartwood reddish; young shoots and leaves densely velvety-tomentose; leaves ovate, with wide sinuses at the base, obsoletely 3-lobed, or more often entire, the lobes when present rounded; blades variable in size, thick and firm, longer than broad; stipules brownish tomentose, 1 to 1.5 cm. long and half as wide, when large inclined to be auriculate and notched at the side, when small, oblong and rounded at the apex; flowers small, about 8 cm. long, the pedicels of about the same length; calyx tube firm and woody, cylindric, 4 cm. long, glabrous externally at maturity, within densely clothed with ascending appressed brown hairs; calyx lobes very dissimilar, the 2 outer triangular, 1.5 cm. long, the inner 2.5 cm. long, with wide felt-like margins; petals about 8 cm. long, broadened toward the apex; pod 10 to 15 cm. long, tapering at the ends.

Type in the U. S. National Herbarium, no. 472290, collected "dans les forêts et pâturages de Nicoya," Costa Rica, February, 1900, by

[1] Ann. Sci. Nat. IV. Bot. 17: 323. 1862.

A. Tonduz (no. 13,498). The following additional specimens have been seen: El Salvador, *Renson* 86; Bismarck, Panama, *Williams* 607; Ancón Hill, Panama, *Bro. Celestine* 119. The following are our own collections: Orotina, 94; Zapotal, 6; Abangarez Pueblo, 5; Tempisque, 113, 170, 189; all from Costa Rica. We collected it also at Escuintla, Guatemala.

The flowers are borne in December, January, and February. The fruit matures in February, March, and April, that is, the dry season of the region where the tree occurs.

This is the smallest-flowered species known. It is widely distributed on the Pacific slope of Central America from sea-level up to 500 or 600 meters and may be the form mentioned by Tonduz as "caractéristique pour la zone inférieur côtes nord et ouest de Cocos Island, alt. 0–100 m."

Ochroma velutina differs from the other species in the following respects: Its wood is harder and heavier; the leaves are densely velutinous on both sides, are nearly or more often quite entire, and are noticeably longer than broad, with a wide sinus at the base; the flowers are small; and the calyx tube is cylindric, firm, and woody.

7. **Ochroma bicolor,** n. sp. GUAPILES BALSA.

A tree attaining large size, 25 meters high and 1 meter in diameter, with long, straight bole in the forest, and excurrent in habit when growing in the open; bark mottled gray and white; leaves chalky white with minute stellate hairs beneath, these 12 to 20-(mostly 20)branched, dark, glistening green and glabrous above, thick and leathery, tending to be acuminate, especially on the older trees, nearly as broad as long, about 32 cm. across, with 2 to 4 obsolete primary lobes on each side, the margin between these usually regularly and very shallowly sinuate-lobed, with a vein terminating in each secondary lobe, the marginal vein prominent; flowers with petals strongly reflexed at anthesis, 10 cm. long with petals extended; calyx tube firm, 5.5 to 6 cm. long, granular-puberulent outside, silvery-sericeous within; calyx lobes 1.5 cm. long, plane on the back, triangular, acute, the inner ones with felted margins; petals white, abruptly expanded above, the claw 1 cm. broad, the limb orbicular, 3 cm. in diameter; stamen tube and stigma equal in length, slightly shorter than the extended petals, much exceeding the recurved petals at anthesis; mass of anthers as broad as long; pod, 16 cm. long; down, light-colored; seed with very short or obsolete funicle, 4 mm. long, 2 mm. thick.—Flowering in November and December; fruiting in January, February, and March.

The type is our no. 10, collected on the grounds of the residence of Superintendent J. H. Wilson of the United Fruit Company, at Guapiles, Costa Rica. We also collected this species at Guácimo, along the Parisima River. It is abundant throughout the whole region known

as the Llanuras de Santa Clara, Costa Rica, at a general elevation of about 250 meters. The only specimens we have seen in herbaria are Captain J. D. Smith's no. 6,453, from La Emilia, Costa Rica, collected in April, 1896, and C. F. Baker's no. 2,149, from Chinandega, Nicaragua.

This species is very abundant in northern Costa Rica from the Reventazón River north to Lake Nicaragua. It grows on higher land than the Limón balsa, and while the two species grow in contiguous districts they do not overlap to any great extent. It extends up the Turrialba Volcano to a height of a thousand meters or more, and undoubtedly occurs on the whole northerly slope of the central cordillera of Costa Rica.

When in leaf only, and especially with young trees, this species closely resembles the Limón balsa, but the flowers are markedly different. The pubescence, general outline, and texture of the leaves, as well as the period of flowering, clearly distinguish the two species.

8. **Ochroma boliviana,** n. sp. BOLIVIAN BALSA.

A tree 8 to 10 meters high, the trunk 20 to 25 cm. in diameter; leaves obsoletely 3-lobed (the margin undulate but not denticulate), nearly orbicular, 30 cm. in diameter, glabrous and dark green above, tawny white and densely velvety beneath; calyx tube 5.5 cm. long, granular-puberulent outside and densely white-tomentose within; calyx lobes herbaceous-membranous, elliptic, acute, 4 cm. long, 2 cm. wide, the inner ones not sharply differentiated into margin and keel, stellate-pubescent without, densely white-tomentose within; petals conspicuously parallel-veined and expanded above, protruding 5 cm. beyond the calyx lobes, 5 cm. broad above.

Evidently very showy in flower, suggesting the northern tulip tree. Flowers borne in July and August; fruit in August and September.

Known only from the following specimens, in the herbarium of the New York Botanical Garden, all from the northeastern part of Bolivia in the vicinity of Mapiri: Mapiri, July–August, 1892, *Bang* 1501 (type); junction of the rivers Beni and Madre de Dios, August, 1886, *Rusby* 1927; Mapiri, September 23, 1901, *Williams* 714; "San Carlos region de Mapiri, 15° lat. sur," September, 1907, *Buchtien*. Vernacular names "tami" and "palo de balsa."

9. **Ochroma obtusa,** n. sp. SANTA MARTA BALSA.

A tree 10 to 15 meters high; twigs glabrate; leaves 20 by 20 cm., conspicuously 3-lobed, the sides of the lobes straight, giving the appearance of a maple leaf, glabrous or nearly so above, scantily covered with slender branched hairs beneath; flower, 14 cm. long; calyx tube 5 cm. long, spreading above, at first granular-puberulent, becoming glabrate; calyx lobes nearly uniform in outline, not carinate, nearly as broad as long, 3 cm. long, densely tomentose on back, ciliate; petals

surpassing the calyx lobes, oblong-spatulate, 3.5 cm. wide, conspicuously parallel-veined.

Type in the herbarium of the New York Botanical Garden, collected at Mamatoca, Santa Marta, Colombia, 1898–99, by Herbert H. Smith (no. 829). The collector states that the tree is "common locally near streams, at 500 to 2,500 feet. Flowers in December and January. Petals pale yellowish. The silk enveloping the seeds is used for pillows, etc., and is sold in the market (as 'lana') at Santa Marta. It is collected in May, when it is found scattered on the ground under the trees." We also refer to this species Broadway no. 4,418, collected March 8, 1913, in Tobago; also Père Duss. no. 3,634, April 10, 1895, from Guadelupe, and his no. 185, from Martinique, although the last two collections do not entirely agree with the type.

ORNITHOLOGY.—*Diagnosis of a new genus of Bucerotidae.* HARRY C. OBERHOLSER, Biological Survey.

The family Bucerotidae at the present time is represented in the Philippine Islands by four genera. One of these, however, *Hydrocorax* Brisson, proves to be composite. This genus *Hydrocorax* was first instituted by Brisson for *Buceros hydrocorax* Linnaeus;[1] much later (1880) another species, *Buceros mindanensis* Tweeddale, was added by Elliot; and subsequently still another, *Buceros semigaleatus* Tweeddale, was referred to this group. The last-mentioned species, however, is clearly not congeneric, and should form the type of a separate monotypic genus which we here call:

Platycorax,[2] gen. nov.

Diagnosis.—Similar to *Hydrocorax* Brisson, but casque entirely different: in superior aspect smaller, shorter, and narrower in general outline (although the bird is actually larger), posteriorly narrower and not so truncate, the anterior portion sharply much constricted, so that the anterior third is much narrower than in *Hydrocorax*, and concave in outline instead of evenly convex throughout its length: in lateral aspect completely flattened anteriorly, with no vertical projection, the whole bill therefore much less in height;[3] feathered interramal space relatively as well as actually broader.

Type.—*Buceros semigaleatus* Tweeddale.

[1] *Hydrocorax* Brisson, Ornith. 4: 565. 1760. (Type by tautonymy, *Buceros hydrocorax* Linnaeus.)

[2] πλατύς, latus; κοραξ, corvus.

[3] These differences in the shape of the casque are well shown by the figures given in the Proceedings of the Zoological Society of London for 1878, pages 278–279.

Remarks.—This new genus differs so much from the other Philippine genera, and in fact from all of the genera of the *Bucerotidae*, that a close comparison is scarcely necessary. It is, of course, apparently most nearly allied to *Hydrocorax*, although it is so different in appearance from *Hydrocorax hydrocorax*, the type of that genus, that it is rather remarkable that it has not been separated before. It should be stated, however, that Dr. Edgar A. Mearns had noticed the very striking structural characters in *Hydrocorax semigaleatus* Tweeddale, and just before his untimely death had planned to create a new generic group for this species.

The third species commonly referred to the genus *Hydrocorax*, *Hydrocorax mindanensis* (Tweeddale), has a smaller casque than *Hydrocorax hydrocorax*, but it is of the same shape, and the species is without doubt correctly placed in the same genus. The type of our new genus, *Platycorax semigaleatus* (Tweeddale), is, therefore, its only species.

The only other generic name applied to any species of *Hydrocorax* is *Platyceros* Cabanis and Heine,[4] the type of which is *Hydrocorax hydrocorax;* so that it is, of course, a synonym of *Hydrocorax* Brisson.

By the present separation of *Platycorax*, there are now five genera of Bucerotidae in the Philippine Islands, of which four, including *Platycorax*, are endemic.

[4] Mus. Hein. 2: 174. 1860.

ABSTRACTS

Authors of scientific papers are requested to see that abstracts, preferably prepared and signed by themselves, are forwarded promptly to the editors. The abstracts should conform in length and general style to those appearing in this issue.

PHYSICS.—*The decrease in ultra-violet and total radiation with usage of quartz mercury vapor lamps.* W. W. COBLENTZ, M. B. LONG, and H. KAHLER. Bur. Stands. Sci. Paper No. 330. Pp. 20. 1918.

It is well known that the radiations emitted by quartz mercury vapor lamps decrease very markedly in intensity with usage of the lamp. The object of this investigation was (1) to devise methods for determining quantitatively the decrease in intensity of the emission with usage and (2) to make preliminary measurements on radiant power life-tests of quartz mercury vapor lamps.

The measurements of the radiations from these lamps were made by means of a thermopile. The ultra-violet rays were absorbed by means of a yellow glass and by this means it was possible to study the decrease in the ultra-violet radiation as well as the decrease in total radiation with usage of the lamp. It was found the intensity of the total radiation as well as the ultra-violet component, decreases to about one-half of its initial value in the course of 1,000 to 1,500 hours.

W. W. C.

PHYSICS.—*New Baumé scale for sugar solutions.* FREDERICK BATES and H. W. BEARCE. Bur. Stands. Tech. Paper No. 115. Pp. 11. 1918.

Many different Baumé scales have been proposed and used in the past. At the present time there are still in use in the United States three different scales for liquids heavier than water. Two of these, namely, the "Holland" scale and the "Gerlach" scale are used in sugar work. Neither is adapted to modern requirements. The new scale lies between the "Holland" and "Gerlach" scales and has three important advantages which should commend it for general use. They are:

1. It is based upon the specific gravity values of Plato, which are considered the most reliable of any available.

2. It is based on 20° C., the most convenient and widely accepted temperature for sugar work.

3. It is based on the modulus 145, which has already been adopted by the Manufacturing Chemists Association of the United States, by the Bureau of Standards, and by all American manufacturers of hydrometers. H. W. B.

SPECTROSCOPY.—*Measurements of wave-lengths in the spectrum of neon.* KEIVIN BURNS, W. F. MEGGERS, and P. W. MERRILL. Bur. Stands. Sci. Paper No. 329. Pp. 10. 1918.

The lines in the neon spectrum are very sharp, a quality which recommends this gas as a standard source wherever the lines have sufficient strength. The ultra-violet group between 3,369A and 3,520A may be used for standards, and there are a few good infra-red lines, but the strength and distribution of the lines in the region 5,852A to 7,438A make the neon spectrum particularly useful as a comparison in this region.

The wave-lengths of fifty-five lines in the neon spectrum have been measured by means of the interferometer. These lines lie in the region 3,369A to 8,495A. The strong lines in the visible region of the spectrum have been observed with great accuracy, the probable error being one part in several millions, or less than one-tenth the width of the line. These strong lines were observed by means of three different pairs of interferometer plates which were each used on several interferometers. The ultra-violet lines and all the strong lines in the visible were compared directly with the fundamental standard 6,438A. Some of the deep red and infra-red lines were compared with well-determined lines in the visible neon spectrum.

One hundred and eighty-nine faint lines in the visible and infra-red neon spectrum have been measured by means of a concave grating. The probable error of these grating measurements is one or two hundredths angstrom. The region covered by the grating observations extends from 5,343A to 8,783A.

The constant differences discovered by Watson are found to hold with remarkable exactness in the case of lines which are strong enough to be measured with the highest accuracy. In fact, the differences are exactly constant within the limits set by the accuracy of the wave-lengths. K. B.

ELECTRICITY.—*Electrical oscillations in antennas and inductance coils.* JOHN M. MILLER. Bur. Stands. Sci. Paper No. 326. Pp. 20. 1918.

The mathematical theory of circuits having uniformly distributed electrical characteristics, such as cables, telephone lines, and transmission lines, is applied to the oscillations in antennas and inductance coils.

It is shown how the frequency of the natural oscillation of an antenna may be determined analytically or graphically when inductance coils or condensers are inserted in the lead-in. Expressions are derived which permit the calculation of the effective resistance, inductance, and capacity of the antenna and it is shown that in so far as frequency or wave-length computations are concerned the simple formula applicable to ordinary circuits with lumped constants gives very accurate results. Experimental methods are given for determining the effective and static or low-frequency values of the antenna constants.

Inductance coils are likewise treated from the standpoint of the theory of distributed characteristics. Expressions are obtained for the reactance of the coil at any frequency and for the natural oscillations of a circuit of coil and condenser. It is further shown that, in so far as the frequency of oscillation is concerned, an inductance coil with distributed characteristics is equivalent to a pure inductance of constant value with a constant capacity across its terminals. Excepting for skin effect, this pure inductance would be the same as the low-frequency inductance of the coil. This explains a fact which has been frequently observed experimentally, in particular for single layer solenoids. J. M. M.

CERAMIC CHEMISTRY.—*The calculation of the rational analysis of clays.* HENRY S. WASHINGTON. Journ. Amer. Ceram. Soc. 1: 405–421. June, 1918.

This paper discusses briefly the factors that render the so-called "rational" analysis of clays uncertain, erroneous, and of little or no value for any purpose. A method for calculating from the chemical analysis the mineral composition, generally quartz, feldspar, and kaolin, is suggested, which is an application of the principles and method of calculating the "norm" of igneous rocks. In the case of clays the procedure is of great simplicity and accuracy, is very expeditious after the chemical analysis has been made, and yields results of great reliability. H. S. W.

CERAMIC CHEMISTRY.—*The effect of certain impurities in causing milkiness in optical glass.* C. N. FENNER and J. B. FERGUSON. Journ. Amer. Ceram. Soc. **1**: 468–477. July, 1918.

In the manufacture of optical glass at one of the plants, a matter which gave considerable difficulty for a while was the occasional production of pots of glass which were affected by opalescence or milkiness. The evidence indicated that the source of the trouble lay in the sulphate and chloride content of the potash. The trouble disappeared when more reliable methods of temperature-control were installed, by which an assurance could be had of keeping the temperatures constantly at 1400° to 1420° C. Later, evidence was obtained which connected the milkiness quite definitely with the impurities mentioned, at least as regards the case under discussion, although in other cases the same effect is to be ascribed to other causes. Reasons are given for the conclusion that the milkiness is caused not by the separation of sulphates or chlorides themselves, but to some slight change in the physical properties of the melt which permits the separation of clouds of minute crystals of cristobalite. R. B. SOSMAN.

BOTANY.—*Naming wheat varieties.* CARLETON R. BALL and J. ALLEN CLARK. Journ. Amer. Soc. Agron. **10**: 89–94. February, 1918.

Crop varieties should be designated by names that are short, simple, appropriate, easily spelled, and easily pronounced. The multiplication of names and other designations for crop varieties has been carried to great extremes. Present designations may be classed as follows: (1) Names, as Fultz or Kubanka; (2) descriptive phrases, as Early Red Clawson; and (3) numbers, as Minnesota no. 162. The existing confusion in names renders difficult the interpretation of published results of experiments. This confusion occurs in two principal ways: (1) The same name is applied to very different varieties in different parts of the country; (2) the same variety passes under several different names in different parts of the country, or even in the same part.

It is desirable to prevent a continuation of such practices and to attempt a solution of the problems already existing. Accordingly, a brief but comprehensive code of nomenclature has been formulated.

CODE OF NOMENCLATURE

1. *Eligibility to naming.* No variety shall be named unless (*a*) distinctly different from existing varieties in one or more recognizable

characters, or (*b*) distinctly superior to them in some character or quality; and unless (*c*) it is to be placed in commercial culture.

2. Priority. No two varieties of the same crop plant shall bear the same name. The name first published (see Rule 4) for a variety shall be the accepted and recognized name except in cases where it has been applied in violation of this code.

3. Form of names. The name of a variety shall consist of a single word.

4. Publication. A varietal name is established by publication. Publication consists (1) in the distribution of a printed description of the variety named, giving its distinguishing characters, or (2) in the publication of a new name for a variety properly described elsewhere, such publication to be made in any book, bulletin, circular, report, trade catalog, or periodical, provided the same bears the date of issue and is distributed generally among agronomists and crop growers; or (3) in certain cases the general recognition of a name for a commercial variety in a community for a number of years may be held to constitute publication.

Paragraphs 1 to 4 have numerous additional clauses not given here which explain or interpret the rule. Paragraphs 5 and 6 deal with formal citation and with changes, respectively.

This code, essentially as presented, was officially adopted by the American Society of Agronomy in November, 1917.

C. R. B.

BOTANY.—*Effects of various salts, acids, germicides, etc., upon the infectivity of the virus causing the mosaic disease of tobacco.* H. A. ALLARD. Journ. Agr. Res. **13**: 619–637. June 17, 1918.

The virus of the mosaic disease of tobacco was treated for various periods of time with different concentrations of acids, salts, etc., to determine their effect upon the infectivity. Nitric and hydrochloric acids, except in concentrations approaching one gram in 50 to 100 cc. of virus solution, affected the infectivity but little. Somewhat stronger solutions of citric, phosphoric, and acetic acid were required to affect the virus. Manganese sulphate, sodium chloride, aluminium sulphate, lithium nitrate, sodium nitrate, lead nitrate, silver nitrate, and mercuric chloride affected the virus but little under the conditions of the experiments. Carbolic acid, creolin, cresol, and phenol affected the infective principle only slightly under the conditions of the experiments, and there was no appreciable difference in their relative effects. Acetone

destroys the infective principle much less readily than ethyl alcohol. In ethyl alcohol the infective principle is destroyed rather quickly in alcoholic solutions stronger than 50 to 55 per cent. Eighty per cent alcoholic strengths killed the virus in less than half an hour. Chloral hydrate, benzoate of soda, quinine bisulphate, naphthalene crystals, camphor, thymol, and glycerin, except in very strong solutions, reduced the infectivity of the virus but little. The virus shows itself considerably more susceptible to solutions of formaldehyde, a 4 per cent strength destroying the infective principle very quickly. When the virus is mixed with talc, kaolin, or soil, it frequently loses its infectious properties more quickly than when merely bottled without the addition of any preservative. H. A. A.

PHYTOPATHOLOGY.—*A serious eelworm or nematode disease of wheat.* L. P. Byars. U. S. Dept. Agr. Circ. 114. July, 1918.

During the past year the eelworm disease of wheat, caused by *Tylenchus tritici* (Steinbuch) Bastian and long known in Europe, has been found causing a great deal of damage in certain parts of the United States, particularly in Virginia. Recent examinations have shown a loss in some fields of as much as 40 per cent of the crop.

Wheat spikelets affected by the disease contain in place of the normal kernels dark, hard galls filled with larvae of the nematode. These larvae escape from the galls into the soil, reach the young seedlings, become located between the leaf sheaths near the bud and are passively elevated to the spikes. There they enter the young flowers and produce the galls within which they develop to maturity and lay eggs. The latter give rise to larvae and in this way their life cycle is completed.

The disease may be controlled by the use of clean seed, crop rotation, and sanitation. If uninfected seed cannot be brought in from localities where the trouble does not occur the sound grain may be separated from the nematode galls by floating off the latter in water.

L. P. B.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

BIOLOGICAL SOCIETY OF WASHINGTON

The 589th regular meeting of the Society was held in the Assembly Hall of the Carnegie Institution, Saturday, January 11, 1919; called to order at 8.00 p.m. by President SMITH; 26 persons present.

On recommendation of the Council the following named persons were elected to membership: GEORGE WILLETT, Los Angeles, and WALTER M. GIFFARD, Honolulu.

Deaths of the following named members were noted: Dr. HOWARD E. AMES and Dr. W. T. FOSTER.

The annual report of the treasurer was received and accepted.

Prof. A. S. HITCHCOCK presented the following proposed amendment to the by-laws: The President shall not be eligible for immediate reelection. To follow at the end of first paragraph of Article II of the by-laws.

President SMITH announced the membership of the Committee on Communications as: A. S. HITCHCOCK, L. O. HOWARD, A. WETMORE, R. E. COKER, J. W. GIDLEY; and of the Committee on Publications as: C. W. RICHMOND, J. H. RILEY, NED DEARBORN, W. L. MCATEE.

Under the heading of Brief Notes, Prof. A. S. HITCHCOCK referred to the work of the Committee on Generic Types of the Botanical Society of America, of which he is chairman. Under the same heading President SMITH referred to the mild winter so far experienced and its effects on the unusual blooming of certain spring-flowering plants. W. L. MCATEE, with reference to the same subject, called attention to the late blooming of some autumn-flowering species. In this connection Dr. L. O. HOWARD called attention to a publication on this same subject by Prof. L. F. WARD many years ago.

J. B. NORTON presented the first formal communication: *A new and easy way to recognize our local asters.* He said investigation of several local species of *Aster* showed great differences in the disk florets. These differences were utilized in a key for the separation of the species which it was suggested could be expanded to include all the forms in the vicinity of Washington. The utilization of similarly neglected characters in other difficult groups would be advisable. His remarks were illustrated by a series of well prepared diagrams showing the variations in the different structures of the disk flowers of *Aster.* Discussion by W. L. MCATEE and A. S. HITCHCOCK.

LYMAN CARRIER presented the second formal communication: *Dr. John Mitchell, an early naturalist and historian.* He gave a synopsis of his rather extensive investigations into the life of JOHN MITCHELL, an early physician in the English Colonies of America who was also noted for his work as a naturalist, historian, and cartographer. Much of his work is published anonymously and much of it is rare and rather inaccessible. Discussion by A. S. HITCHCOCK.

J. W. GIDLEY gave the third paper of the program: *Significance of the divergence of the first digit in the primitive mammalian foot.*

A. S. HITCHCOCK presented the last paper of the program: *A peculiar species of Lasiacis.* Discussion by T. S. PALMER. This paper appears in full in this JOURNAL (**9**: 35–38. January 19, 1919).

The 590th regular meeting of the Society was held in the Auditorium of the New National Museum, Saturday, January 25, 1919; called to order at 8.00 p.m. by President SMITH; 29 persons present.

On recommendation of the Council the following named persons were elected to membership: ERICH W. SCHWARTZE, Bureau of Chemistry; MYRON H. SWENK, University of Nebraska; R. C. MCGREGOR, Bureau of Science, Manila.

Informal communications were presented as follows: General T. E. WILCOX: *Remarks on the berries of Mitchella.* President SMITH: *Exhibition of and remarks on a piece of baleen of the right whale of the Pacific Coast.* He stated that this species is nearing extinction as among 999 whales taken last year on the Pacific Coast but one was a right whale. He also referred to whale meat as human food. W. L. MCATEE: *Reference to an old publication, 1783 to 1784,* in which it appears that peanuts and cotton were commonly raised about Washington at that time.

The first paper of the regular program was by G. DALLAS HANNA: *Additions to the avifauna of the Pribilof Islands, Alaska, including species new to North America.* In the collection of birds made on the Pribilof Islands, Alaska, during the period June, 1916, to September, 1918, there were 21 species which had not been secured there or reported therefrom before. Four of these had not previously been collected within the limits of North America.

Species new to North America and the Pribilof Islands: *Eunetta falcata,* Falcated Teal; *Heteroscelus brevipes,* Polynesian Tattler; *Thalassoaetus pelagicus,* Kamchatkan Sea Eagle; *Anthus spinoletta japonicus,* Japanese Pippit.

Species new to the Pribilof Islands only: *Brachyramphus marmoratus,* Marbled Marrelet; *Puffinus tenuirostris,* Slender-billed Shearwater; *Nettion crecca,* European Teal; *Aristonetta valisineria,* Canvas-back; *Clangula clangula americana,* American Golden-eye; *Arctonetta fischeri,* Spectacled Eider; *Oidemia deglandi dixoni,* Pacific White-winged Scoter; *Chen hyperborea hyperborea,* Snow Goose; *Branta canadensis hutchinsii,* Hutchin's Goose; *Numenius tahitiensis,* Bristle-thighed Curlew; *Haematopus bachmani,* Black Oyster-catcher; *Archibuteo*

lagopus sancti-johannis, Rough-legged Hawk; *Spinus pinus*, Pine Siskin; *Plectrophenax hyperboreus*, McKay's Snow Bunting; *Junco hyemalis hyemalis*, State-colored Junco; *Petrochelidon lunifrons lunifrons*, Cliff Swallow; *Hylocichla aliciae aliciae*, Gray-cheeked Thrush.

Some notes on the food habits and color phases of Rodger's fulmar, a common Pribilof bird, were given.

Discussion by A. S. HITCHCOCK, WM. PALMER, W. L. MCATEE for E. A. PREBLE, and by L. STEJNEGER.

The second and final paper of the regular program was by W. L. MCATEE: *An account of poisonous sumachs, Rhus poisoning, and remedies therefor.* Mr. MCATEE gave a detailed account of the classification and natural history of the poisonous sumachs, of the various theories as to why they poison, of the symptoms of poisoning, and of the host of remedies that have been employed against it. Discussion by Dr. V. K. CHESNUT.

The 591st meeting of the Society was held in the Assembly Hall of the Cosmos Club, Saturday, February 8, 1919; called to order at 8.00 p.m. by President SMITH; 53 persons present.

On recommendation of the Council, O. E. JENNINGS, Curator of Botany, Carnegie Museum, was elected to membership.

The following amendment to the By-laws read at the 589th meeting was favorably voted on by the Society: "The President shall not be eligible for immediate reelection;" to follow at the end of the first paragraph of Article II.

Under the heading of brief notes and exhibition of specimens, Dr. R. W. SHUFELDT exhibited seven lantern slides of pitcher plants, *Sarracenia purpurea*, taken about two years ago in an extensive swamp near Glen Burnie, Maryland. He pointed out that this plant is now practically extinct in the District of Columbia. After describing the main characters of this and related species he showed by means of one of the lantern slides some experiments he had been making with *S. purpurea* extending over an entire summer, the main features of which consisted in keeping a number of growing plants indoors and giving them a very limited amount of light. Gradually the new-coming leaves evinced an entire change of form and color. They became pale green with every semblance of markings effaced while the decided diminution in size was accompanied by a shrinkage of the wing, a change in outline, and an almost complete atrophy of the pitchers. In this connection Prof. W. P. HAY said one of his students had brought him a pitcher plant leaf stating it had been found in a locality near the city of Washington. Professor HAY had visited the alleged locality with the student, but they had been unable to find the rest of the plant. The student however was a reliable person and Professor HAY had no reason to doubt that the leaf had been found as stated. I. N. HOFFMAN presented an informal note on certain nesting habits of Shufeldt's junco.

The following formal communications were presented:

E. W. NELSON: *Dallia pectoralis, Alaska's most remarkable fish.* Mr. Nelson gave an account of the appearance and habits of this fish and described the important part it plays in the economic life of the natives of parts of Alaska. He related some of the myths concerning its vitality after freezing. Discussion by Dr. H. M. SMITH.

VERNON BAILEY: *The western skunk cabbage in its prime.* Mr. Bailey gave an account of the characters and natural history of this handsome plant and exhibited lantern slides of it in flower. Discussion by the chair and others.

M. W. LYON, JR.: *Isohemagglutinin groups of men.* Doctor Lyon defined the term isohemagglutination and gave a brief account of the discovery of the four well-recognized groups of men as determined by the action of the serum of each group upon the red blood corpuscles of the others. He pointed out that the first author to recognize the four groups as such was Jan Jansky′ in a rather obscure publication in 1907 (Sborník Klinicky′-Arch. Bohèmes de Médécine Clinique **8:** 85–139. 1907). He designated these groups as I, II, III, and IV in the order of their frequency of occurrence. Moss, in 1910 (Bull. Johns Hopkins Hosp. **21:** 63–70. March, 1910), independently described the four groups and designated them, respectively, as IV, II, III, and I. As Jansky″s group I has the most active serum and the most resistant corpuscles Dr. Lyon suggested it might be called the *sthenic* group. For its direct opposite, Jansky″s IV, he suggested the term *antisthenic.* For the more common of the other two groups, II, and its opposite, III, he suggested the designations *parasthenic* and *antiparasthenic,* respectively. A lantern slide table showing the agglutinative action of the serums of 16 persons on the red blood corpuscles of the same persons was shown. A series of test tubes showing the action of sthenic, parasthenic, and antiparasthenic serum on corpuscles of each of these groups was exhibited. The antisthenic group is very rare and the speaker knew of no individual available belonging to that group when he prepared the demonstration tubes. Discussion by the chair, E. W. NELSON, W. P. TAYLOR, and others.

M. W. LYON, JR., *Recording Secretary.*

SCIENTIFIC NOTES AND NEWS

Preparations are being made for another expedition to the Mt. Katmai district in Alaska, under the auspices of the National Geographic Society. Professor ROBERT F. GRIGGS, of the Ohio State University, is director of the expedition, which will consist of photographic, surveying, topographic, and scientific parties. The scientific work will include studies of the revegetation of country devastated by ashfalls, and the zoology of the region at the foot of the Valley of Ten Thousand Smokes. In addition, a cooperating party from the Geophysical Laboratory of the Carnegie Institution, consisting of E. T. ALLEN, C. N. FENNER, and E. G. ZIES, will study the physics and chemistry of the fumaroles and the petrology of the Valley. The expedition will leave in May and return in September.

A joint influenza committee has just been created to study the recent epidemic and to make comparable, so far as possible, the influenza data gathered by the government departments. The members of this committee are: Dr. WILLIAM H. DAVIS, chairman, and Mr. C. S. SLOANE, representing the Bureau of the Census; Dr. WADE H. FROST and Mr. EDGAR SYDENSTRICKER of the Public Health Service; Col. D. C. HOWARD, Col. F. F. RUSSELL and Lieut. Col. A. G. LOVE, United States Army; Lieut. Commander J. R. PHELPS and Surgeon CARROLL FOX, United States Navy.

The proposed American Society of Mammalogists has issued an invitation to join in a movement to organize a society for the promotion of the interests and study of mammalogy. It is intended that the society shall devote itself to the subject in a broad way, including studies of habits, life histories, evolution, ecology, and other phases. Plans call for the publication of a journal in which both popular and technical matter shall be presented, for holding meetings, both general and sectional, aiding research and engaging in such other activities as may be deemed expedient. The organization meeting will be held in the New National Museum, Washington, D. C., April 3 and 4, 1919, sessions commencing at 10.00 a.m. and 2.00 p.m. No program of papers has been planned for this meeting.

The Committee on Organization is: HARTLEY H. T. JACKSON, Chairman, U. S. Biological Survey; WALTER P. TAYLOR, Secretary, U. S. Biological Survey; GLOVER M. ALLEN, Boston Society of Natural History; J. A. ALLEN, American Museum of Natural History; JOSEPH GRINNELL, University of California; N. HOLLISTER, National Zoological Park; ARTHUR H. HOWELL, U. S. Biological Survey; WILFRED H. OSGOOD, Field Museum of Natural History; EDWARD A. PREBLE, U. S. Biological Survey; WITMER STONE, Academy of Natural Sciences of Philadelphia.

Mr. A. A. BENEDICT, formerly of the University of Pittsburgh, has joined the staff of the Bureau of Standards as physicist in the sugar laboratory.

The following members of the Chemical Warfare Service have joined the staff of the Bureau of Standards since January: Captain J. M. BRAHAM, in the electrochemical laboratory; Lieut. C. W. CLIFFORD, sugar laboratory; S. C. LANGDON, electrochemical laboratory; F. W. REYNOLDS (formerly at Edgewood Arsenal), laboratory of metallurgical chemistry; P. WRIGHTSMAN, gas laboratory.

Mr. J. R. ECKMAN, formerly of the Ordnance Department, has joined the staff of the Bureau of Standards as chemist in the analytical laboratory.

Dr. GRAHAM EDGAR, formerly secretary of the Washington office of the Research Information Service, National Research Council, has resigned and is now with the Nitrate Division of the Ordnance Department of the Army. Mr. GORDON S. FULCHER is his successor as secretary of the Information Service.

Dr. C. S. HUDSON, Chief of the Carbohydrate Laboratory of the Bureau of Chemistry, resigned from the Bureau on February 12, 1919, and is now with the Samuel Heath Company, of Trenton, New Jersey.

Col. E. LESTER JONES, after service in the Army for about a year, both in America and France, has returned to his duties as head of the Coast and Geodetic Survey.

Dr. CHESTER N. MYERS, organic chemist of the Hygienic Laboratory, Public Health Service, resigned from the Service early in March, to organize a research laboratory for H. A. Metz and Company, manufacturers of local anesthetics and arsenicals, in Brooklyn, N. Y.

Mr. W. B. NEWKIRK, formerly with the Oxnard Sugar Company, has joined the staff of the Bureau of Standards as sugar technologist.

Capt. E. H. PAGENHART, of the U. S. Coast and Geodetic Survey, is now stationed at Fort Barrancas, Pensacola, Florida.

Captain L. L. STEELE, of the Ordnance Department, U. S. A., has joined the staff of the Bureau of Standards as chemist in the varnish laboratory.

Mr. A. F. STEVENSON, sanitary chemist with the Hygienic Laboratory, Public Health Service, resigned from the Service on March 1, to go into commercial research work in New York City.

Mr. C. W. STRATFORD, formerly of the Tidewater Oil Company, has recently come to the Bureau of Standards to take charge of an extensive investigation on the general subject of lubrication, with particular reference to the lubrication of internal combustion engines.

A Coast and Geodetic Survey party, under the direction of O. W. SWAINSON, is at work on the triangulation and topographic surveying of the Virgin Islands, recently acquired from Denmark.

Mr. E. D. WALEN, who for the past three years has been chief of the Textile Section of the Bureau of Standards and has been engaged in war research on the development of cotton fabrics as a substitute for linen for use in airplane wing surfaces, resigned from the Bureau in February and is now with the Textile Research Corporation at Boston, Massachusetts.